

REMARKS

The Examiner is thanked for the thorough examination of the application. No new matter is believed to be added to the application by this Amendment.

Status Of The Claims

Claims 1-15 are pending in the application. The Examiner has withdrawn claims 5-14 from consideration. Claim 15 finds support in paragraph **0046** of the specification.

Objections To The Specification

The Examiner objects to the Title as not being descriptive. A substitute Title is provided that is more indicative of the invention being claimed.

The Examiner objects to paragraph **0046**. Paragraph **0046** has been amended to remove an extraneous editorial comment.

Rejection Under 35 U.S.C. §103(a) Over Holmberg In View Of Yudasaka

Claims 1-4 are rejected under 35 U.S.C. §103(a) as being obvious over Holmberg (U.S. Patent 6,160,270) in view of Yudasaka (U.S. Patent 5,989,945). Applicants traverse.

The Present Invention And Its Advantages

The present invention pertains to a method of manufacturing a liquid crystal display (LCD) that minimizes the number of masks and reduces wastage of photoresist. The manufacturing method of the present invention may include a number of novel

steps that entail forming a gate line on a substrate by applying a gate photoresist pattern by printing, and then sequentially forming a gate insulating layer, a semiconductor layer, and a high-concentrated N+ layer over the gate line. The method also includes forming an active region over the high-concentrated N+ layer by applying an active photoresist pattern by printing, forming a conductive layer over the active region, and depositing a photoresist layer over the conductive layer. Then, a mask is applied over the photoresist layer, followed by a lithography process, to thereby forming a source/drain electrode. One of the many advantages of the present invention includes utilizing only one mask over the photoresist layer (see claim 15).

Once the source/drain electrode is formed, a passivation layer is formed over the source/drain electrode, and a contact hole is formed over the passivation layer by applying a contact hole photoresist pattern by printing. A pixel electrode is formed over the passivation layer by printing a pixel electrode pixel electrode photoresist pattern.

In the invention, a printing method, having less minuteness but easy processing, is applied at the time of forming a pattern with a wider effective line width. A lithography process using a mask is applied at the time of forming a part such as the channel region with a narrow effective line width. Accordingly, processing is simplified and a large amount of photoresist or color resin is not uselessly discarded.

Distinctions Of The Invention Over Holmberg and Yudasaka

Holmberg pertains to active matrix displays incorporating a thin film transistor (TFT). In the Office Action, the Examiner points to Figure 6 of Holmberg. Figure 6F of Holmberg is reproduced below.

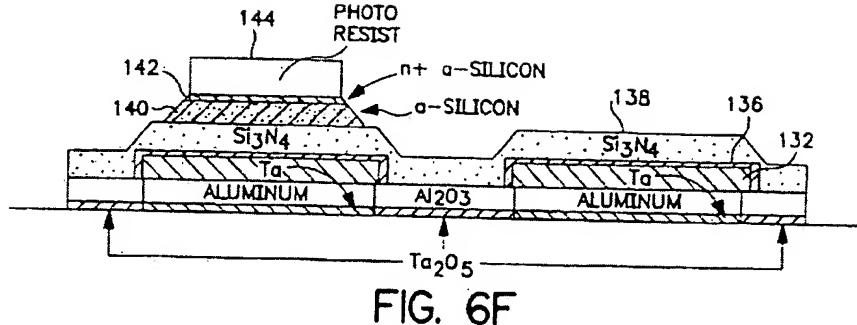


Figure 6F of Holmberg shows a photoresist layer 144 formed over a n+ a-silicon layer 142 and an amorphous silicon layer 140. The processing regarding the photoresist layer 144 is discussed at column 10, lines 53-59 of Holmberg: "The layer 144 is patterned and the layers 140 and 142 then are etched to form the basic transistor structure illustrated in **FIG. 6F**. . . Referring to **FIG. 6G**, the remaining photo resist layer is stripped . . ."

Holmberg, that is, fails to disclose patterning the photoresist using a mask, such as is set forth in claim 1 of the present invention. Holmberg additionally fails to disclose using a single mask, as is set forth in claim 15 of the present invention.

At page 3, lines 9-12 of the Office Action, the Examiner admits to Holmberg's failure to disclose a mask:

It might be argued that Holmberg does not disclose the step of "applying a mask", since it does not use the term "mask" and merely discloses that the photoresist layer is "patterned" [col. 10, lines 56ff]. (One of ordinary skill in the art would presume a mask of some kind is used, but this is perhaps not made explicit in the reference.)

By this, the Examiner is asserting that using masking (or a single mask) to pattern the photoresist is inherent in Holmberg. However, inherency need not bar patentability.

Regarding inherency, the Federal Circuit stated in In re Robertson, that "to establish inherency, extrinsic evidence must make clear that the missing descriptive matter was necessarily present in the thing described in the reference, and would be so recognized by persons with ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a set of circumstances is not sufficient." In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949 (Fed. Cir. 1999). Further, it has been held that the mere fact that a certain thing may result from a given set of circumstances is not sufficient, and occasional results are not inherent. MEHL/Biophile International v. Milgram, 192 F.3d 1362, 1365, 52 USPQ2d 1303 (Fed. Cir. 1999).

However, the Examiner fails to provide evidence of mask use but asserts that this is well known in the art. At page 3, lines 13-17 of the Office Action, the Examiner asserts:

The examiner takes official notice that applying a mask of some kind to pattern the photoresist layer in question is well-known in the art, and it would have been obvious to one of ordinary skill in the art at the time of the invention to do so in this case, motivated by the conventionality of doing so, with the advantages of high patterning precision and reliability.

However, "high patterning precision" is not a motivating factor in the present invention. As is discussed at paragraph 0098 of the specification, some of the

motivating factors to produce the present invention are a simplified process using less photoresist when the patterning is less minute:

[0098] In the invention, a printing method, having less minuteness but easy processing, is applied at the time of forming a pattern of a wider effective line width. A lithography process using a mask is applied at the time of forming a minute part such as the channel region with a narrow effective line width. Accordingly, processes are simplified, and a large amount of photoresist or color resin is not uselessly discarded.

Therefore, the motivating factor posited by the Examiner would not be used to produce the present invention.

At page 3, lines 19-20 of the Office Action, the Examiner admits to additional failings of Holmberg: "Holmberg does not disclose that the other photoresist patterns are formed by printing." The Examiner then turns to Yudasaka. However Yadasaka fails to address the deficiencies of Holmberg in disclosing or suggesting all the elements of claim 1 of the present invention, much less the single mask of claim 15. A *prima facie* case of obviousness has not been made over claim 1. Claims depending upon claim 1 are patentable for at least the above reasons.

This rejection is overcome and withdrawal thereof is respectfully requested.

Foreign Priority

The Examiner has acknowledged foreign priority in the Office Action mailed January 24, 2006.

The Drawings

The Examiner has accepted the drawing in the Office Action mailed January 24, 2006.

Conclusion

The Examiner's objections and rejection have been overcome, obviated or rendered moot. No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Respectfully submitted,

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